

Niagara Watershed Plan

Planning and Economic Development Committee

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Niagara Watershed Plan Equivalency Project

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Presentation Outline

1. Background/Scope/Process
2. Niagara Watersheds –
Tertiary/Quaternary/Subwatersheds
3. Goals and Objectives of Watershed Plan Equivalency
4. Characterization
5. Water Resource System
6. Management Guidance

1. Background/Scope/Process

Niagara Watershed Plan Equivalency

What is it and why is it important?

- Purpose is to inform the new Niagara Official Plan in accordance with Provincial direction including the identification of a water resource system and decision on the allocation of growth
- Provides a framework for future watershed planning in the Region, that will:
 - Protect water resources
 - Manage human activities, land, water, aquatic life, and resources
 - Assess cumulative, cross-jurisdictional and cross-watershed impacts

What is an Equivalent Watershed Plan (WP)?

The Province allows for the development of an Equivalent WP informed by existing desktop material (i.e., no new fieldwork or modelling) to support official plans.

Niagara Watershed Plan Equivalency – *Continued (1)*

What is it and why is it important?

- Focuses on priority areas of known concern related to:
 - Heightened development or resource pressure
 - Management needs for water quality and quantity
- Informed by review and evaluation of existing work on:
 - Natural Heritage System
 - Water Resource System
 - Natural Hazards
- Provides guidance on issues identified by Niagara community

Niagara Watershed Plan Equivalency – *Continued* (2)

Key Activities

1. Confirm Study Boundaries and Establish Priorities
2. Develop Watershed Planning - Goals and Objectives
3. Characterize Existing Conditions (Desktop)
4. Integrate Natural Heritage System (N.H.S.) and inform the Water Resource System (W.R.S.)
5. Define Watershed Elements and Best Practices & Provide Guidance for Future more Detailed and Local Studies

Reporting Structure

- NWP (E) has been structured into three (3) separate report volumes:
 - Volume 1: Characterization
 - Volume 2: Management
 - Volume 3: Growth
- the content has been aligned into the three (3) primary topic areas, and the findings and recommendations have been linked within and across each volume

Niagara Watershed Plan Equivalency – *Continued* (3)

Role in the NOP



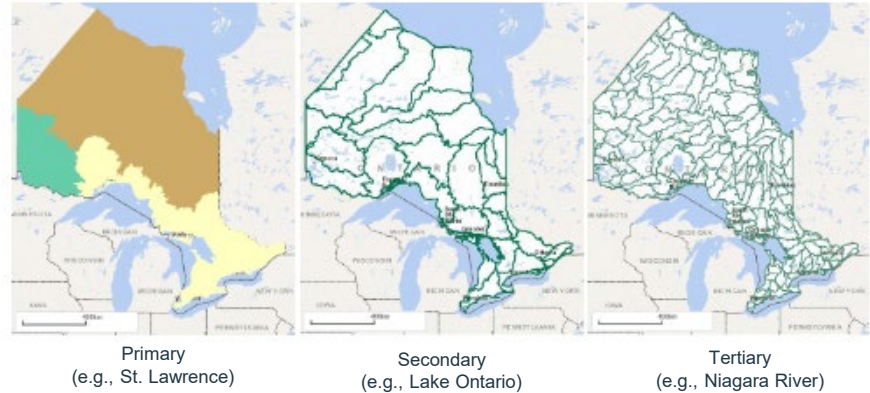
2. Niagara Watersheds – Tertiary/Quaternary/Subwatersheds

Niagara Region Watersheds

Watersheds are areas of land that drain rainfall runoff and snowmelt into waterways toward a single, common outlet.



Figure 1 - A simple watershed with the boundary determined at the watershed divide

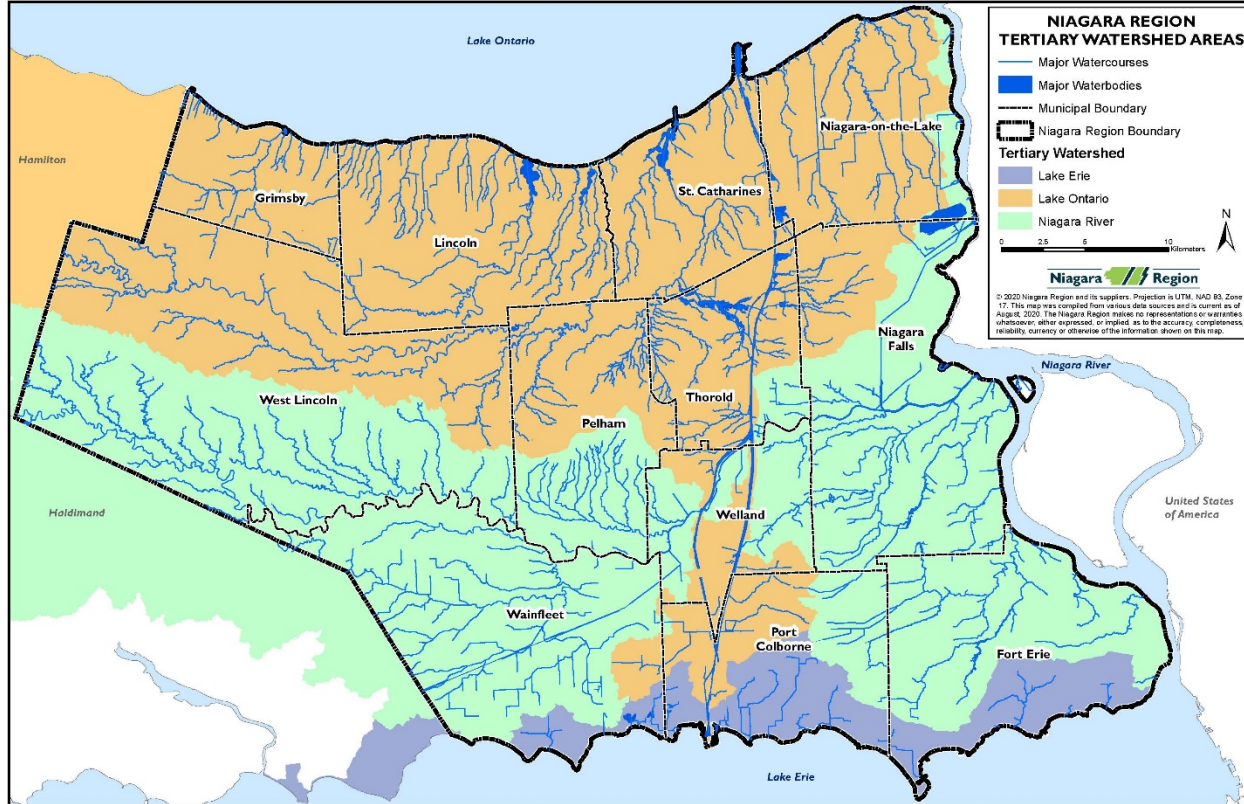


Watersheds in Ontario are categorized by the Province as primary, secondary, tertiary and quaternary.

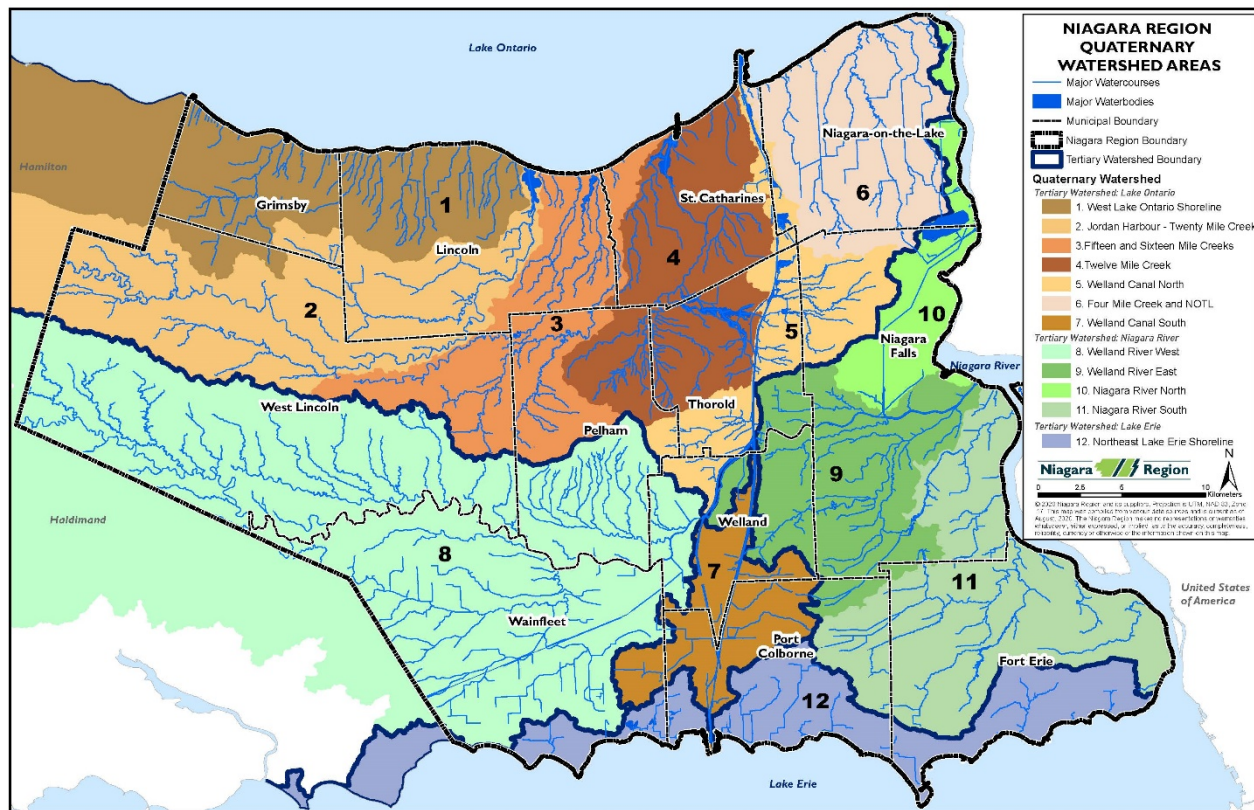
Niagara Region is responsible for watershed planning at the tertiary and quaternary level.

The Region will work with local area municipalities (LAMs) to complete subwatershed planning to support growth through Secondary Plans or similar planning exercises.

Niagara Region Tertiary Watershed Areas



Niagara Region Quaternary Watershed Areas



2. Goals and Objectives

Goals & Objectives of the NWP (E)

- Goals & Objectives Discussion Paper circulated for public and stakeholder input
→ Survey conducted and input has been incorporated into the following Goals which are underpinned by a set of Objectives :
 1. *Establish and Maintain Contemporary and Accurate Understanding/Mapping of the Watershed*
 2. *Protect Water Quality and Water Quantity*
 3. *Adaptively Manage and Monitor the Watershed*
 4. *Protect and Enhance Interactions between the Natural Heritage System and Water Resource System*
 5. *Ensure Land Use Planning is Informed by Watershed Planning*
 6. *Create Resilient Communities to Protect Human Health and Safety, and the Natural Environment*
 7. *Engage the community to ensure the Watershed Plan Equivalent reflects community-identified priorities & local conditions*

Niagara Watershed Characterization

Process

- Desktop review of existing information sources (mapping, data, reports, etc.); NPCA key source of information and consultation
- Characterization completed at the tertiary watershed scale
 - *(Lake Ontario, Niagara River, Lake Erie)*
 - Reported findings at the quaternary watershed scale
- Summary consisted of identification of presence and distribution of various watershed/environmental features and sensitivities

Components

- Drainage Systems
 - Drainage Area, Quaternary Watershed & Subwatershed Systems, Watercourses
- Soil Types
 - High, Medium, Low and Unknown Sensitivities to Urbanization (based on permeability)
- Topography / Slope
 - Low (0-2%), Medium (2-10%) and High (>10%) Slope Conditions
- Groundwater and Source Water Protection
 - Sensitive Features – Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Intake Protection Zones (IPZs)

Niagara Watershed Characterization – *Continued*

Components – *Continued*

- Natural Hazards
 - Karst, Regulated Floodplains & Shorelines, Top of Slope
- Natural Heritage
 - Fish & Fish Habitat:
 - *Habitat Characterization (Aquatic Habitat, Watercourse Permanency & Barriers, Thermal Regimes)*
 - *Fish Species & Fish Species at Risk*
 - Terrestrial:
 - *Vegetation Community (Ecological Land Classification (ELC), Woodlands & Wetlands)*
 - *Flora, Fungi & Fauna*
 - *Areas of Natural and Scientific Interest (ANSI)*
- Existing Land Use
 - Urban Conditions
 - *Municipalities, Hamlets, Secondary Plans*
 - Agricultural Lands
 - *Land Base Identification, Constructed Drains*
- Watershed Monitoring
 - Niagara Region Inventory:
 - *Climate Stations*
 - *Streamflow Stations*
 - *Water Quality Locations*
 - *Groundwater Stations*

5. Water Resource System (WRS)

Water Resource System (WRS)

Policy Direction

- The Province has not prepared maps showing a WRS – however, the PPS & Growth Plan require that a WRS be identified
- While the components of the WRS can be identified for effective policy development, not all can be mapped or delineated at this time
 - Further mapping of components can be identified through future study

“Watershed planning or equivalent will inform ... the identification of water resource systems.”
(Growth Plan, 4.2.1.3a)

What is a Water Resource System?

- “A system consisting of ground water features and areas and surface water features (including shoreline areas), and hydrologic functions, which provide the water resources necessary to sustain healthy aquatic and terrestrial ecosystems and human water consumption. The water resource system **will** comprise **key hydrologic features** and **key hydrologic areas**”. (Growth Plan 2019)

Water Resource System (WRS) – *Components*

- Key Hydrologic Features (required)
 - Provincially Significant Wetlands and other wetlands
 - Permanent and intermittent streams
 - Inland lakes and their littoral zones
 - Seepage areas and springs
- Key Hydrologic Areas (required)
 - Significant ground water recharge areas
 - Highly vulnerable aquifers
 - Significant surface water contribution areas
- Hydrologic Functions
 - Floodplain
 - Karst
- Groundwater features
 - Recharge/discharge areas
 - Ecologically Significant Groundwater Recharge Areas
 - Water tables
 - Aquifers and unsaturated zones
- Surface Water Features
 - Headwaters
 - Recharge/discharge areas
 - Associated riparian lands
- Shoreline Areas
- Vegetation Protection Zone

Integration of the NHS & WRS

- The Natural Heritage System (NHS) and Water Resource System (WRS) are to be considered collectively as the integrated Natural Environment System (NES)
- The Natural Environment Work Program (NEWP) was initiated in 2018 to support the Region in the identification of, and preparation of policies for the NES
 - The NHS is being established as part of the ongoing NEWP
 - The WRS is being informed by watershed planning (the NWP (E)) through identification of features & systems which should be considered required components of the WRS
- The NWP (E) has identified key interactions & interdependencies between features and functions of the NHS & WRS to inform planning and policy for an integrated NES
 - Recommendations provided for opportunities to confirm and refine the NES through future studies (i.e. scoping and screening)

6. Management Guidance

Niagara Watershed Management & Guidance

Overview

- Established in accordance with the Draft Provincial Watershed Planning Guidelines (2018), management guidance consisting of:
 - *Water Management (Quantity / Quality)*
 - *Climate Change*
 - *Natural Hazards*
 - *Cumulative Impacts*
 - *Land Use Impact Management*
 - *Future Studies & Monitoring*
- Review of existing Watershed Plans & Reporting to identify gaps related to guidance / management
 - Focus placed on watershed areas identified for potential growth
 - Information Gaps to be addressed as part of future studies

Components

- Water Management – Criteria & Guidance
 - *Flood Control, Erosion Control, Water Balance/Budget, Water Quality*
 - *Management Opportunities for Growth Areas*
- Climate Change
 - *Consideration of the Niagara Region Climate Change Work Program*
 - *Climate Change & Infrastructure Planning Best Practices*
- Natural Hazards
 - *Hazard Definition & Pending Updates/Gaps – Ongoing Studies (NPCA)*
- Cumulative Impacts
 - *Review of Existing Land Uses to Identify Trends & "Stressed" Watershed Systems*

Niagara Watershed Management & Guidance – *Continued (1)*

Land Use Impact Management & Preliminary Guidance

- Natural Heritage System
 - Policy Protection & Regulation – Mitigation Hierarchy
 - Mechanisms for Protecting, Management and Enhancing the NHS (Linkages, Enhancement Areas, Buffers)
- Drainage Features
 - Watercourse Feature Constraints (Classification & Management Recommendations)
 - Headwater Drainage Features (Classification & Management Recommendations)
 - Erosion Hazard Corridors
 - Corridor Enhancements and Rehabilitation
 - Maintenance of Channel Length & Sediment Supply
 - Road Crossings
 - Erosion Thresholds & SWM requirements
- Water System (Surface & Ground)
 - Stormwater Management Practices (Flood Control, Erosion Control, Water Budget (LID BMPs), Water Quality)
 - Importance of LID BMPs for watershed management

LID BMP Practice	Flood Control	Erosion Control	Quality Control	Runoff Volume Reduction	Groundwater Recharge
Rooftop Storage	X				
Parking Lot Storage	X				
Amended Topsoil		X	X	X	X
Green Roofs		X	X	X	
Oil/Grit Separators			X		
Rainwater Harvesting		X		X	
Pervious Pipes		X	X	X	X
Oversized Pipes	X				
Permeable Pavement		X	X	X	X
Soakaway Pits		X	X	X	X
Infiltration Trenches		X	X	X	X
Bumpouts		X	X	X	X
Grassed Swales			X		
Biofilters/ Bioswales		X	X	X	X

Niagara Watershed Management & Guidance – *Continued (2)*

Future Studies & Monitoring

- Framework for Watershed and Municipal Planning Process
 - *Quaternary Watershed Studies, Subwatershed Studies, Master Environmental Servicing Plans, etc.*
- Niagara Region Monitoring Network Inventory – Identifies Gaps in Coverage for Consideration in Future Studies
- Monitoring Framework for:
 - *Water (Quantity / Quality)*
 - *Relates to Hydrologic and Hydraulic Modelling*
 - *Stream Systems (Stream Morphology, Fish and Fish Habitat, Benthic Invertebrates)*
 - *Natural Heritage System (Vegetation, Breeding Birds, Calling Amphibians, etc.)*
 - *Adaptive Management Practices*

Conclusions / Next Steps

Conclusions & Next Steps

- Characterization
 - Tertiary Watershed Characterization provides deeper understanding of the natural and water-based systems present within the Niagara Region
 - Best available information and inventory from Niagara Watershed Plan Equivalency assembled for assessment of growth areas, focused on:
 - *Constraints and Opportunities*
- Management Guidance provided related to:
 - *Water (Quantity / Quality)*
 - *Climate Change*
 - *Cumulative Impacts*
 - *Natural Heritage System / Water Resource System*
 - *Future Monitoring/Adaptive Management Practices*
 - *Future Studies*
- The NWP (E) sets the framework for subsequent watershed planning initiatives within the Niagara Region

Conclusions & Next Steps – *Continued*

- Niagara Watershed Plan Equivalency – Three (3) Volumes
 - Volume 1: Characterization and Volume 2: Management
 - *To be released as a Draft for public & stakeholder consultation*
 - Volume 3: Growth
 - *Pending release in Q3 2021*

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